

Maryland State
Department of Information Technology



Enterprise Architecture Handbook

Version 1.3

July 2020

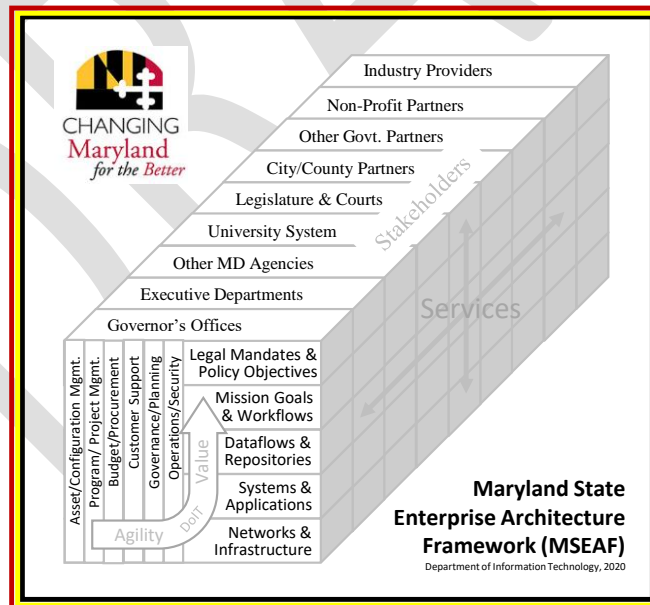


Table of Contents

1.0 Overview

1.1 Purpose	X
1.2 Value & Risk	XX

2.0 Program

2.1 Authorities	XX
2.3 Policy	XX
2.3 Standards	XX
2.4 Bodies	XX

3.0 Approach

3.1 Governance	XX
3.2 Methodology	XX
3.3 Framework	XX
3.4 Artifacts	XX
3.5 Repository	XX
3.6 Associated Best Practices	XX

4.0 Implementation

4.1 Program Management Office	XX
4.2 Reference Baseline	XX
4.3 Analysis Projects	XX
4.4 Design Projects	XX
4.5 Solution Architecture	XX
4.6 Best Practice Incorporation	XX

5.0 Utilization

5.1 Organizational Transformation	XX
5.2 Strategic Planning	XX
5.3 Digital Enablement	XX
5.4 Enterprise Resource Planning	XX
5.5 Portfolio Management	XX
5.6 Systems Integration	XX
5.7 Data Sharing	XX
5.8 Vendor Alignment	XX
5.9 Security & Privacy	XX

Terms & Abbreviations

XX

References

XX

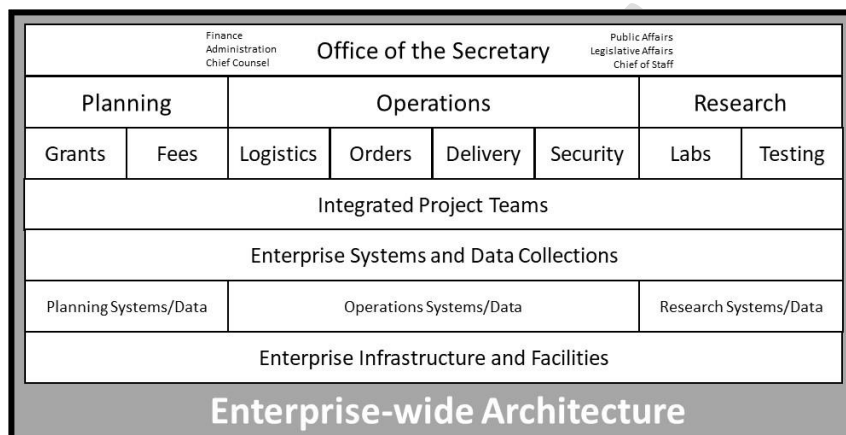
Appendices

A. Implementation Methodology	XX
B. Design Artifact Examples	XX
C. Analysis Reference Model Taxonomies	XX
D. Recommended Standards	XX
E. Training Curricula	XX

1.0 Overview

1.1 The Purpose of Enterprise Architecture

Enterprise Architecture (EA) is a blended management and technology discipline that examines all aspects of information technology (IT) services within and between Maryland State Agencies to improve mission effectiveness, the efficient use of resources, and agility when faced with changes. To do this, EA uses an integrated approach to strategic, business, and technology planning to produce high-level and detailed views of services, systems, solutions, and standards. The following diagram shows an example agency and high-level view of structure and functions, with EA providing a consistent holistic context.



1.2 The Value & Risk of Doing Enterprise Architecture

The products of an organization-wide EA program are often welcomed by agency leadership and stakeholders who benefit from enterprise-level solutions. EA is usually not welcomed by program-level stakeholders who benefit from local control and program-specific solutions. Additionally, the historical culture and processes of an agency may not be supportive of enterprise-wide standards so active change management will be required. The following are some specific areas of value and risk when doing EA:

1.2.1 Value Areas

Goal Alignment. Strategic goals are the priority objectives that enable an Agency to accomplish its mission, doing so in alignment with the Governor's priorities and in a legally compliant manner. Goals do not accomplish themselves, so initiatives (activities) are required in the form of ongoing programs and focused, time-specific projects. EA also promotes the use of Key Performance Indicator (KPI) metrics for cost, schedule, and performance to track an initiative's status.

Resource Efficiency. EA helps to ensure that an agency's resources are best positioned to support the achievement of strategic goals. These resources include people, skills, funding, workflows, data, systems, networks, and facilities. By providing an agency-wide view of business and technology resources, gaps and overlaps become apparent and can be addressed.

Cost Reduction. Enterprise-wide solutions normally have a lower total cost of ownership than multiple instances of similar capabilities among program offices. Similarly, EA can provide analyses to guide system and service outsourcing/insourcing decisions, as well as enterprise-level software licensing that often provides a lower per-seat and per-instance cost. EA also promotes a portfolio approach to business and technology capital and operating expenses, which involves identifying, prioritizing, and funding program assets.

Increased Agility. EA promotes agency-wide standards, methods, and solutions. This decreases gaps and overlaps in capabilities and increases the amount of coordination within and between agency operating units. These changes increase in the agency's ability to adopt new approaches and technologies at a more rapid pace and more holistic scales.

1.2.2 Risk Areas

Loss of Local Control. It has historically been the case in many government agencies that a great deal of control over the method of execution for ongoing activities, staffing, and standards has been located at the program level. Program managers and staff become used to this and enjoy being able to have a significant say in how things are done in their area. EA brings organization-wide standards and methods to an agency, which runs counter to the historical norm of local control. Accordingly, program managers and staff are likely to resist the loss of control over standards and methods.

Exposure of Inefficiencies. EA promotes agency-wide inventories of business and technology processes, resources, and capabilities. This includes programs, systems, personnel, and spending. Analysis of inventories often reveals gaps and overlaps in resources and capabilities, such as multiple instances of records management systems, procurement and contracting groups, data warehouses, and office automation software. The identification (exposure) of these gaps and overlaps – and the prospect that the agency will act on these inefficiencies – is often not welcome by affected program offices who can expect that changes will occur in responsibilities and resources.

Cultural Change. Government agencies are staffed with people who usually perform their roles as part of groups that have norms which form over time in response to internal and external influences. This includes State-wide and agency policies, formal and informal authority structures, trust relationships, methods to deal with conflict, beliefs, reward structures, the personalities/styles of individuals, and historical failures and successes of the group. EA promotes a culture of cooperative achievement that is focused on attaining the agency's most important goals through a combination of enterprise- and program-level solutions and resources. The change from a group-centered culture to an enterprise-centered culture may be resisted by groups and individuals who feel that they are being marginalized and/or long-held beliefs and hard-won authorities are being done away with.

Resource Constraints. Agencies have limited resources (financial, people, skills, equipment, time, facilities, etc.). An EA program will need to compete for these resources and to do this successfully, EA must show that the value being produced exceeds the direct, indirect, and opportunity costs. EA should be able to do this as capability gaps/overlaps are closed.

The both cases (areas of value and risk), the best way to ensure that the agency EA program will be successful is to have an engaged senior executive who is the policy and results champion, hire an experienced Chief Enterprise Architect to lead the program, involve stakeholders from the outset, and promote frequent communication between all of them regarding the EA approach that will be adopted, what each role will be, how methods and resources may change, and that there can flexibility in the pace of adoption and the order of the program areas that will be effected.

2.0 Program Authority and Oversight

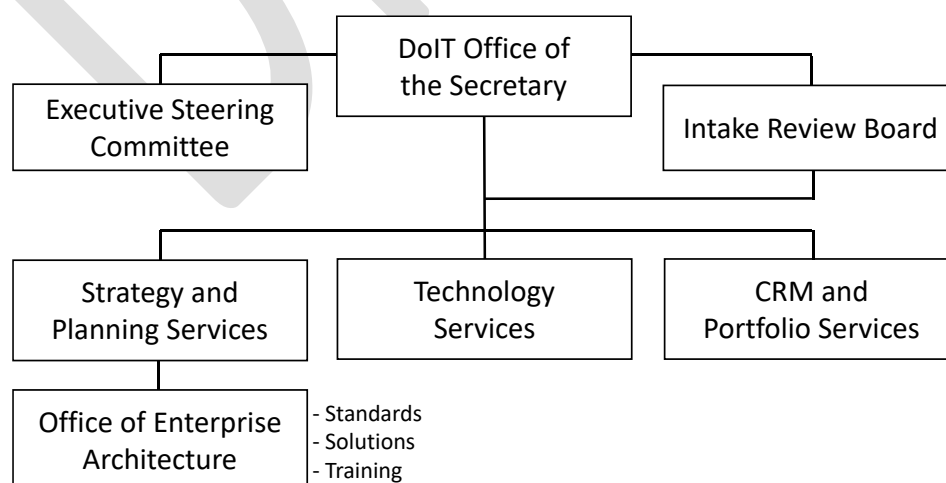
The term “governance” refers to a process that provides oversight and decision-making capabilities over some area of agency activity. In the case of an agency’s Enterprise Architecture program it is important to position the program and governance bodies at a level that has enterprise-wide authority and can affect strategic, business, and technology planning, standards, methods, and resources. The following are additional considerations in establishing and executing EA governance bodies and procedures.

2.1 Authorities. Maryland State Finance and Procurement Code, Annotated, Sections 3A-202 and 301-309. This section of State law gives the Department of Information Technology (DoIT) the responsibility for oversight of major IT projects throughout State government, as well as to be a provider of State-wide IT services and standards.

2.2 Policy. DoIT maintains an online IT Policy Catalog (www.doit.gov/policy) that provides Secretary-approved procedures and standards for State Agencies to follow in providing or consuming IT products/services within their agency and with other agencies. One of these policies covers the DoIT EA Program Office and associated procedures/products.

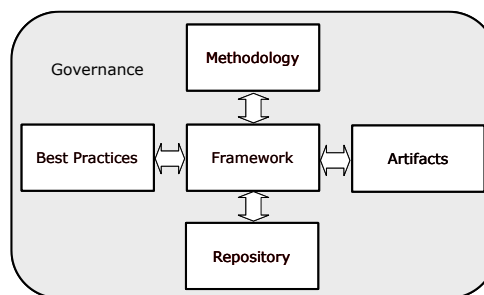
2.3 Standards. The Maryland State Enterprise Architecture (MSEA) approach that is presented in this Handbook is consistent with the concepts/methods of the Federal EA Framework (v2), NASCIO’s EA Toolkit (v3), and industry best practices, including the TOGAF, ITIL, and TBM. DoIT develops, promulgates, and updates IT-related standards and reusable solutions for State Agencies to use, doing so in a collaborative manner through the IT Policy, Intake Request, and service processes.

2.4 Bodies. The primary DoIT governance body is the Executive Steering Committee (ESC), whose members include all executives at the Secretarial and Director level. The ESC meets bi-weekly and members participate in several planning and decision-making processes including the Agency Request Intake Working Group that meets weekly, the Major IT Development Oversight Process that reviews agency major IT project status’ monthly, and the IT Policy Review Board that meets bi-weekly. ESC members also participate in the oversight of DoIT service teams in nearly a dozen areas including infrastructure, telecommunications, the State-wide radio network, web content management, user help desk, hardware/software acquisition, cyber security, enterprise architecture advisement, and IT program management. The following is a high-level organization chart for DoIT governance bodies.



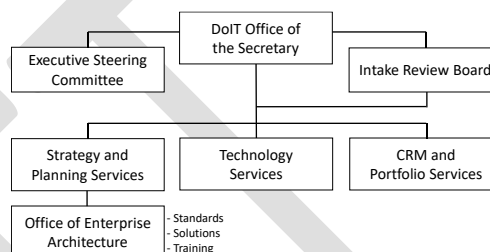
3.0 Architecture Approach

The Maryland State Enterprise Architecture (MSEA) approach has six core elements: governance, framework, methodology, artifacts, an online repository, and associated best practices. The following are summary descriptions of each element, followed by more detailed information. Appendices provide analysis taxonomies and documentation (artifact) examples.



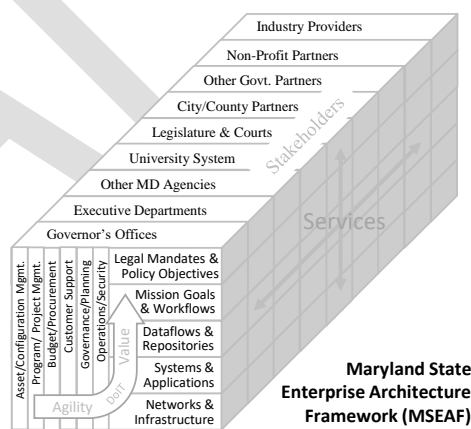
3.1 Governance.

The term “governance” refers to a process that provides oversight and decision-making capabilities over some area of agency activity. In DoIT, the EA Program Office is located in the Strategy and Policy Services area, with oversight being provided by the Office of the Secretary and the Executive Steering Committee.



3.2 Framework.

The EA framework is a model that graphically shows the parts (sub-architecture domains) of the holistic architecture. By defining what parts of the enterprise are included in the EA, the framework defines the scope of the architecture. The geometry of the framework also indicates the relationship of the parts. The MSEA Framework is shown to the right and has eight domains: five hierarchical sub-architectures (strategy, business, data, systems, and infrastructure) and three “threads” (security, skills, and standards) that have touchpoints to each hierarchical domain.



3.3 Methodology.

The EA methodology (method) is a 4-phase, 20-step process to establish the EA Program, development of current/future views in each domain, a transition plan, and utilization activities with EA projects and agency governance bodies.

- Phase 1. Establish the EA Program
 - Phase 2. Documentation Preps
 - Phase 3. Establish Current/Future Views
 - Phase 4: Maintain and Use EA Products
- (see Appendix A for methodology steps)

3.4 Artifacts.

Artifacts are various types of documentation that support EA analysis and design activities. Each area of the framework has recommended artifacts that are widely accepted, use standard notation sets and methods, and can be developed/updated by readily available modelers who are trained in that artifact.

Artifact ID Codes

Strategic Domain (S)	Nets/Infra Domain (NI)
Business Domain (B)	Security/Privacy Thread (SP)
Data Domain (D)	Standards Thread (ST)
System/App Domain (SA)	Workforce Skills Thread (W)

(see Appendices B & C for example artifacts)

3.5 Online Repository.

An online EA repository is an artifact storage and retrieval site located on the agency's internal network. To ease navigation, the repository uses a web browser interface and presentation matrix that is consistent with the parts of the framework and allows users to select the area they are interested in. Artifacts that have a logical relationship are linked and can be accessed together. Some artifact modeling tools some with frameworks and a repository.

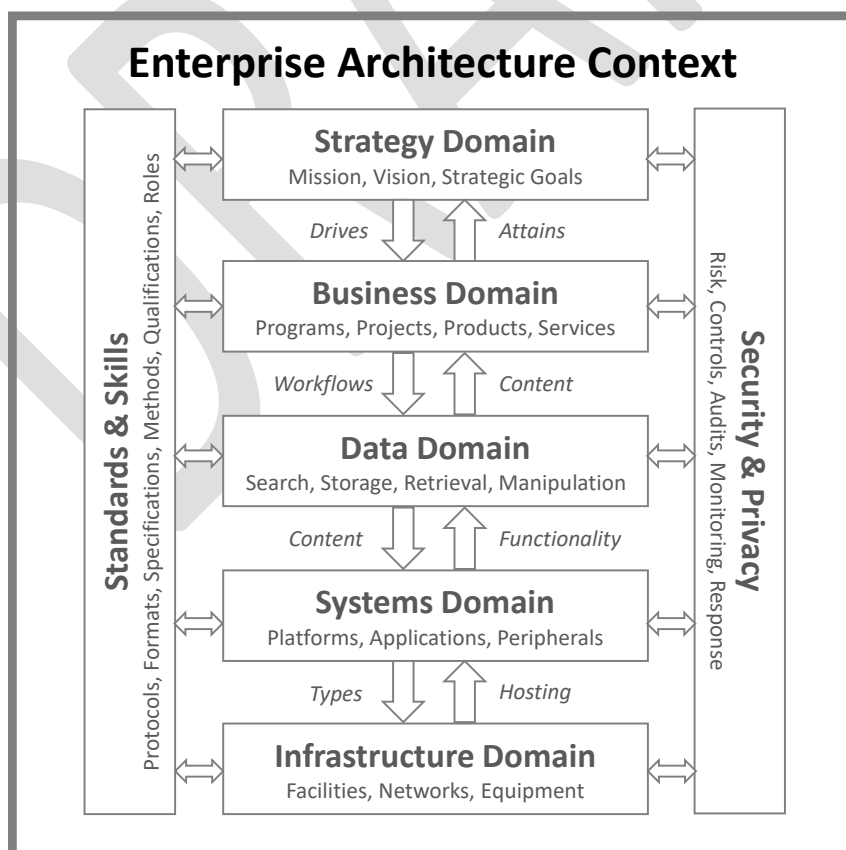
EA Management Plan	Future EA Views	EA Standards	EA Program	EA Tutorial	Site Map	
Enterprise Architecture Repository						
Current EA Views	Goals & Initiatives	Products & Services	Data & Information	Systems & Applications	Networks & Infrastructure	Security Solutions
High Level View	Strategic Plan	Business Plan	Knowledge Warehouse	Business Systems	Wide Area Network	Security Program
Mid Level View	Goals & Initiatives	Business Processes	Information Flows	Support Systems	Local Area Network	System Configurations
Detailed View	Performance Measures	Investment Portfolio	Data Dictionary	Application Inventory	Buildings & Equipment	Data Privacy

3.6. Associated Best Practices.

A best practice is an established method in the public and/or private sector which helps organizations improve their performance. EA does not compete with best practices, instead, EA provides context and standards for locating where and when a best practice is to be used within and between agency operating units. Example best practices for each domain and thread areas are shown to the right.

Strategic Domain: SWOT, Balanced Scorecard, KPIs
 Business Domain: BPI, BPR, BPMN Flowchart
 Data Domain: ERD, DFD, Data Dictionary
 System Domain: Interface Diagram, Inventories
 Infrastructure Domain: Network Maps, TCP/IP
 Security Thread: Controls List, ATO, SOC-2
 Standards Thread: NIST, IEEE, ISO, NASCIO, ANSI
 Skills Thread: Position Descriptions, KSA list

Enterprise Architecture not only incorporates established best practices, but it also provides the context and relationships for the sub-architecture domains as is illustrated below.



4.0 Implementation

Implementing an agency-wide Enterprise Architecture centers on two things: (1) establishing an ongoing capability; and (2) creating/maintaining a coordinated set of domain views using various artifact types. The ongoing capability is best done through a dedicated EA Program Management Office (EA-PMO) and the artifacts should be made available through an internal online repository. The following is a summary of the EA implementation phases and steps (Appendix A provides additional details).

Phase 1. Establish the EA Program

- Step 1: Establish the EA Management Program and identify a Chief Architect.
- Step 2: Establish an EA implementation methodology.
- Step 3: Establish EA governance and links to other management processes.
- Step 4: Develop an EA Communication Plan to gain stakeholder buy-in.

Phase 2. Prepare to Document

- Step 5: Select an EA documentation framework.
- Step 6: Identify EA Lines of Business/Crosscuts and the order of their documentation.
- Step 7: Identify the EA components to be documented framework-wide.
- Step 8: Select documentation methods appropriate for the framework.
- Step 9: Select software applications/tools to support automated EA documentation.
- Step 10: Select and establish an on-line EA repository for documentation and analysis.

Phase 3. Establish Current and Future Views

- Step 11: Evaluate existing business and technology documentation for use in the EA.
- Step 12: Document current views of existing EA components in all framework areas.
- Step 13: Develop several future business/technology operating scenarios.
- Step 14: Identify future planning assumptions for each future scenario.
- Step 15: Use the scenarios and inputs to drive documentation of future EA components.
- Step 16: Develop an EA Management Plan to sequence planned changes in the EA.

Phase 4: Maintain and Use EA Products

- Step 17: Use EA information to support planning and decision-making.
- Step 18: Regularly update current and future views of EA components.
- Step 19: Maintain an EA Repository for modeling and analysis products.
- Step 20: Release annual updates to the EA Management Plan.

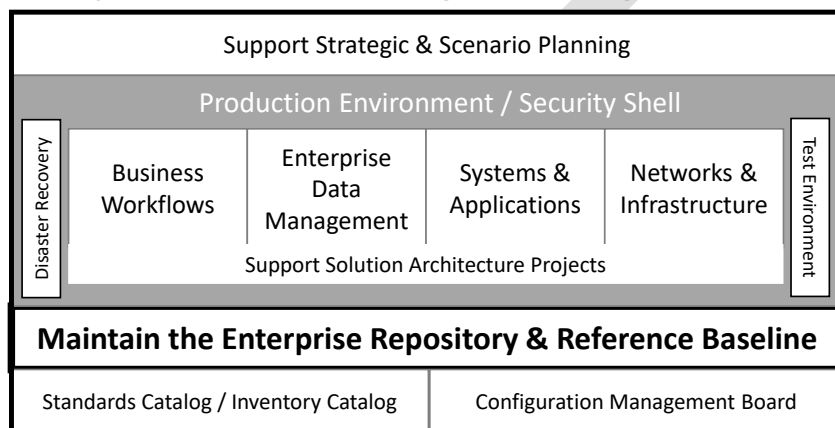
These are generalized phases and steps, therefore it's expected that agencies will adjust implementation activities to address situations that are particular to that agency. This could include more definition on roles, responsibilities, domain ownership; additional change management actions, specifics on vendor alignment, coordination with external agency partners, or agency history/cultural considerations.

4.1 Program Management Office

The purpose of the EA Program Management Office (EA-PMO) is to provide a focal point for establishing and maintaining an agency-wide EA capability and documentation set. The EA-PMO should be led by an experienced Chief Enterprise Architect who reports to the primary executive sponsor of the EA program. There are several possible approaches to how an EA-PMO operates: advisory only, does all EA work itself, loans architects to project teams, or a hybrid of these. In that EA provides context and standards for all agency operating domains, it is easy to overwhelm an EA-PMO if it is tasked to do all EA analysis

and design work itself – even if significant resources are provided (trained people, funding, equipment, offices, etc.). Accordingly, agencies should consider making the EA-PMO a coordination and advisement group, wherein they maintain the agency-wide architecture baseline, the online EA repository, support the Configuration Control Board, and “loan” appropriately-skilled enterprise and/or domain-specific architects to business and technology project teams throughout the agency. As with any ongoing agency program, the EA-PMO will require the aforementioned resources, strong executive support, and the understanding and cooperation of stakeholders during the 8-12 months that it often takes for staffing, initial inventories, and alignment of solutioning with the agency project management process. The following is a graphic depiction of the functions of the EA-PMO:

Enterprise Architecture Program Management Office



4.2 Reference Baseline

One of the agency EA program primary roles should be to develop and maintain an authoritative and accurate inventory and configuration model of current business and technology processes and systems, as well as to collaboratively identify legal requirements and industry standards that must be followed. Collectively, these inventories, models, and lists form a “Reference Baseline” that should be used by planning and decision-making functions throughout the agency (e.g., capital planning, configuration control, asset management, security, logistics, and mission operations). This EA Reference Baseline should be viewed as a dynamic artifact that is maintained by the EA-PMO with stakeholder input as part of a regularized schedule of major EA updates (bi-annual or a major change).

4.3 Analysis Projects

Of the two general categories of EA activities (analysis and design), the analysis projects usually focus on the development of new categorization methods, conducting inventories using existing methods, or assessing data, information, and/or models to identify patterns, confirm status, or validate options. Categorization methods include the use of taxonomy artifacts, also called “Reference Models”. The Maryland State EA approach that is described in this Handbook includes a set of Domain Reference Models whose taxonomies are provided in Appendix B. These Reference Models can be changed as part of the normal EA artifact update process and input from stakeholders in various agencies is encouraged. The agency EA-PMO should be trained in EA analysis project methods (DoIT can provide this training).

4.4 Design Projects

The other general category of EA activities is design projects, which usually focus on gathering stakeholder requirements for a new capability and identifying viable business and technology solutions

that are consistent with State legal/policy requirements, agency standards, and industry best practices. Design activities can include modeling workflows, dataflows, applications, systems, networks, and facilities. The EA Reference Baseline provides context and standards that solutions need to consider. Examples of models and related artifacts are provided in Appendix C. The agency EA-PMO should be trained in EA design project methods (DoIT can provide this training).

4.5 Solution Architecture

The term “Solution Architecture” is normally used to refer to EA design projects that are focused on solving a business (mission) problem with some form of IT enablement (also called “digitization”). Agile approaches to project management and solution development are also frequently used, including identifying a scrum master, requirements scrums with stakeholders, development sprints, a minimum viable product, and rapid/frequent iteration of the product with key stakeholders. The use of agile methods and maintaining a focus on agency/user requirements will hopefully produce more useful solution in a shorter time span, perhaps even with lower costs. Modern EA methods seek to support solution delivery timespans in hours/days/weeks instead of months/years.

4.6 Best Practice Incorporation

One of the unique aspects of modern, holistic EA methods is that established best practices from government and industry are not only recognized but are recommended for use in the appropriate domain area(s). EA’s function has evolved to provide a context (Reference Baseline) and to show how methods are or aren’t related (e.g., linking workflows and dataflows to application and storage stacks). Rather than compete with mature, proven best practices – holistic EA seeks to identify where, how, and when those practices should be used by the agency. The following are examples of best practices that agencies commonly use, but may not have been de-conflicted and aligned where possible:

- Strategic Planning, Balanced Scorecard, SWOT Analysis
- Business Process Re-engineering, Capital Planning/Business Cases
- Robotic Process Automation, Workflow Modeling, Agile Projects
- Object-Oriented Data and Systems Design, Reusable Object Library
- Enterprise Data Management, Data Migration Methods
- Business Intelligence, Big Data Modeling, High-Performance Computing
- Enterprise Service Bus, Open-Source Software, Open APIs
- E-Commerce Channels, Online Service Delivery Web Portal
- Converged/Virtualized Storage & Compute Stacks, User Machines
- Unified Endpoint Management, Smart-Device Integration
- Remote User Channels, Standardized Worker Mobility Kits
- Converged Voice, Data, Video, Mobile, Satcom Network
- Digitized End-to-End Asset Tracking and Logistical Support
- Cloud Service Insourcing/Outsourcing (IaaS, PaaS, SaaS, DaaS)
- Continuous Cybersecurity Monitoring, Detection, Response
- Process Quality Control, Continuous 3rd Party Auditing

Without EA providing standards and a baseline to be the overarching context and “broker”, the three-dozen best practice areas listed above are often found to compete or create gaps and overlaps in the agency’s capabilities, which lowers mission effectiveness and increases operating costs. Use EA to improve the agency’s selection, implementation, use, and retirement of a “catalog” of best practices.

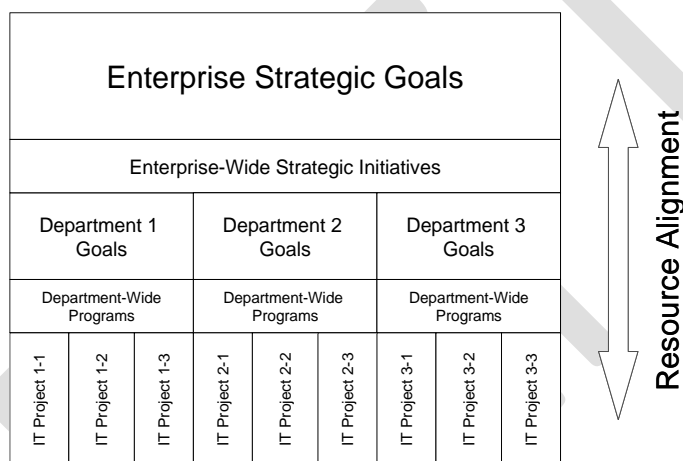
5.0 Utilization

5.1 Organizational Transformation

Agency-wide transformation requires an enterprise-level view of mission activities, programs, and supporting resources. Enterprise Architecture, when practiced holistically can provide the context for moving operating units forward in a coordinated manner while incorporating new methods and technologies. Normally, transformation (the introduction of significantly different concepts and methods) is pursued in selected business units and may not affect the entire organization, but the agency should still utilize its EA baseline as the authoritative reference for making changes.

5.2 Strategic Planning

Agency strategic planning activities include the update of goals, resource allocations, master IT plans, ongoing program plans, and time-specific project plans. The alignment of these plans to the achieving agency and Administration goals is one of the most important aspects of strategic planning.



5.3 Digital Enablement / Transformation

Digital enablement is a fancy term for the use of IT to move a paper-based process to an online electronic process, as well as the further improvement of electronic (automated) processes. Many of the mission and support activities in every State Agency already have some level of digital enablement, which usually results in more flexibility, lower costs, and higher production output (e.g., number of cases handled, inquiries answered, information articles disseminated). Digital transformation is the IT component of Organizational Transformation (see Section 5.1 above). This is a higher-level transformative activity which looks beyond individual processes to entire agency business units with a goal of making significant changes in functions and IT-based methods. The results of digital transformation efforts can include the incorporation of new lines of business, new technologies, new strategic partners, new customer groups, and new mission areas. Agencies that are experienced in digital enablement and transformation initiatives are able to make these changes more rapidly and with better results. Agencies should be mindful of new costs associated with needed IT resources and services (footprint) that underpin the digital enablement or transformation effort, especially when there is an expansion of the footprint. Some of the additional IT costs can be offset by savings that are realized as a process is digitized, which includes fewer facility, infrastructure, and personnel costs.

5.4 Enterprise Resource Planning

As State Agencies use EA to view the organization holistically, the requirement for enterprise-wide IT solutions is likely to grow. These solutions are often referred to as Enterprise Resource Planning (ERP) systems and they include both mission and support solutions for case management, supply chain management, finance and accounting, human resources, and general administration. ERP solutions usually address a broad range of related activities and therefore must meet dozens of agency requirements that arise from legal and policy mandates, customer needs, and industry best practices. Agencies can achieve higher levels of productivity at lower levels of cost per transaction if they use mature large-scale ERP systems from experienced vendors. It is rare that public sector organizations are able to create and maintain ERP systems with the reliability, functionality, and cost efficiency of mature commercial products that have been produced by vendors who specialize in common ERP areas. Accordingly, State Agencies should use EA as a way to maintain control of their IT baseline as ERP products with large footprints come and go, which they will do. A good planning and contracting target for an ERP product or service is 5-7 years.

5.5 Portfolio Management

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

5.6 Systems Integration

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

5.7 Data Sharing

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

5.8 Vendor Alignment

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

5.9 Security & Privacy

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Abbreviations

ADM	Architecture Development Method
ANSI	American National Standards Institute
ARM	Application Reference Model
AI	Artificial Intelligence
ATO	Approval to Operate
BA	Business Analyst
BPI	Business Process Improvement
BPR	Business Process Re-engineering
BRM	Business Reference Model
CEN	Comité Européen de Normalisation
CMMI	Capability Maturity Model Integration
DBA	Database Administrator
DODAF	Department of Defense Architecture Framework
DoIT	Department of Information Technology
DRM	Data Reference Model
EA	Enterprise Architecture
EAAM	Enterprise Architecture Audit Method [EA6]
EA6	Enterprise Architecture Cube [Framework]
FEAF	Federal Enterprise Architecture Framework
IaaS	Infrastructure-as-a-Service
IEEE	Institute of Electrical and Electronic Engineers
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Standards Organization
ITIL	Information Technology Infrastructure Library
JAD	Joint Application Design
NASCIO	National Association of State Chief Information Officers
OSI	Open Systems Interconnection [Model]
PaaS	Platform as a Service
RPA	Robotic Process Automation
QA	Quality Assurance
SaaS	Software-as-a-Service
SDLC	System Development Life Cycle
SOA	Service-Oriented Architecture
SOC-1	Service Organization Controls [Systems]
SOC-2	Service Organization Controls 2 [Security]
SRM	Systems Reference Model
TBM	Technology Business Model
TCPIP	Transmission Control Protocol Internet Protocol
TOGAF	The Open Group Architecture Framework
TRM	Technology Reference Model
VOIP	Voice Over Internet Protocol
VM	Virtual Module

Definition of Terms

The following terms are used in this Handbook and are original to the Handbook or are taken from other authoritative sources, which are given at the end of the definition (e.g., NIST, IEEE, ISO, CEN, ANSI, FEAF, DODAF, Maryland State Law).

Abstraction
Agency
Agile Methods
Application Reference Model
Architecture Domain
Artifact
Back Office Systems
Big Data
Bot
Business Case
Business Process Improvement
Business Process Re-engineering
Business Requirement
Business Plan
Business Unit
Capital Planning
Cloud Services
Continuity of Operations
Convergence
Converged Application Stack
Cyber
Cybersecurity
Database
Data Entity
Data Lake
Data Object
Data Privacy
Data Reference Model
Data Warehouse
Digitization
Disaster Recovery
Earned Value Management
Edge Device
End-User
Enterprise
Enterprise Architecture
Enterprise Data Management
Enterprise Service Bus
Entity Relationship Diagram
Executive Sponsor
Framework
Front Office Systems
Governance
Hardware

Help Desk
High-Performance Computing
Horseblanket Diagram
Hyper-Converged Application Stack
Information Technology
Information Technology Reference Model
Information Technology System
Infrastructure
Infrastructure-as-a-Service
Internal Network
Internet
Internet of Things
Iterative Development
Key Performance Measure
Line of Business
Local Area Network
Methodology
Middleware
Mission Statement
Object-Oriented
Organizational Restructuring
Performance Reference Model
Peripheral Device
Platform-as-a-Service
Plotter
Program
Project
Quantum Computing
Records Management
Reference Architecture
Re-skilling
Risk
Risk Management
Robotic Process Automation
Run-time Environment
Security Control
Security Reference Model
Segment Architecture
Semantic Model
Service Provider
Solution Architecture
Software
Software-as-a-Service
Stakeholder
Storage Area Network
Storage Array
Strategic Planning
Super-Computing

Supply Chain
System Development Lifecycle
Technology Business Model
Technology Reference Model
Telecommunications Network
Total Cost of Ownership
Use Case
Virtualization
Vendor
Voice Network
Waterfall Development
Wide Area Network

DRAFT

References

Department of Defense Architecture Framework, version 2.02 (2011).

EA6 Cube Framework, 4th edition (2020).

Federal EA Framework, version 2.0 (2013).

Information Technology Infrastructure Library, version 4 (2019).

Maryland Department of Information Technology, 2020 Master IT Plan.

NASCIO EA Toolkit, version 3.0 (2004).

Technology Business Model, version 2.0 (2018).

The Open Group Architecture Framework, version 9.2 (2018).

Appendices

Appendix A.

Implementation Methodology

DRAFT

Appendix B.
Design Artifact Examples

DRAFT

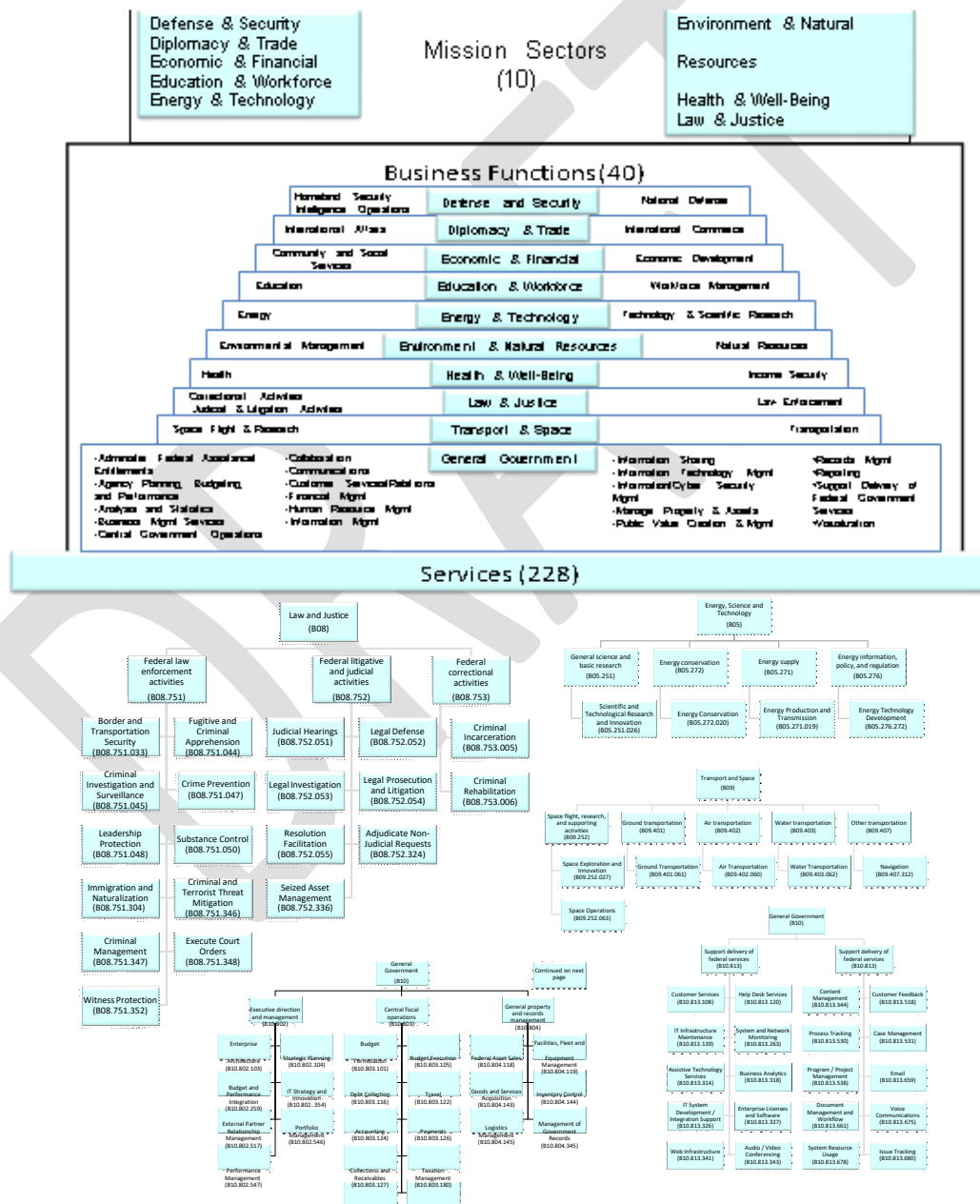
Business Reference Model

The BRM taxonomy is structured as a three-layer hierarchy representing Maryland State Executive Branch Mission Sectors, Business Functions and Services.

Mission Sector – Identifies the ten business areas of Maryland State Government.

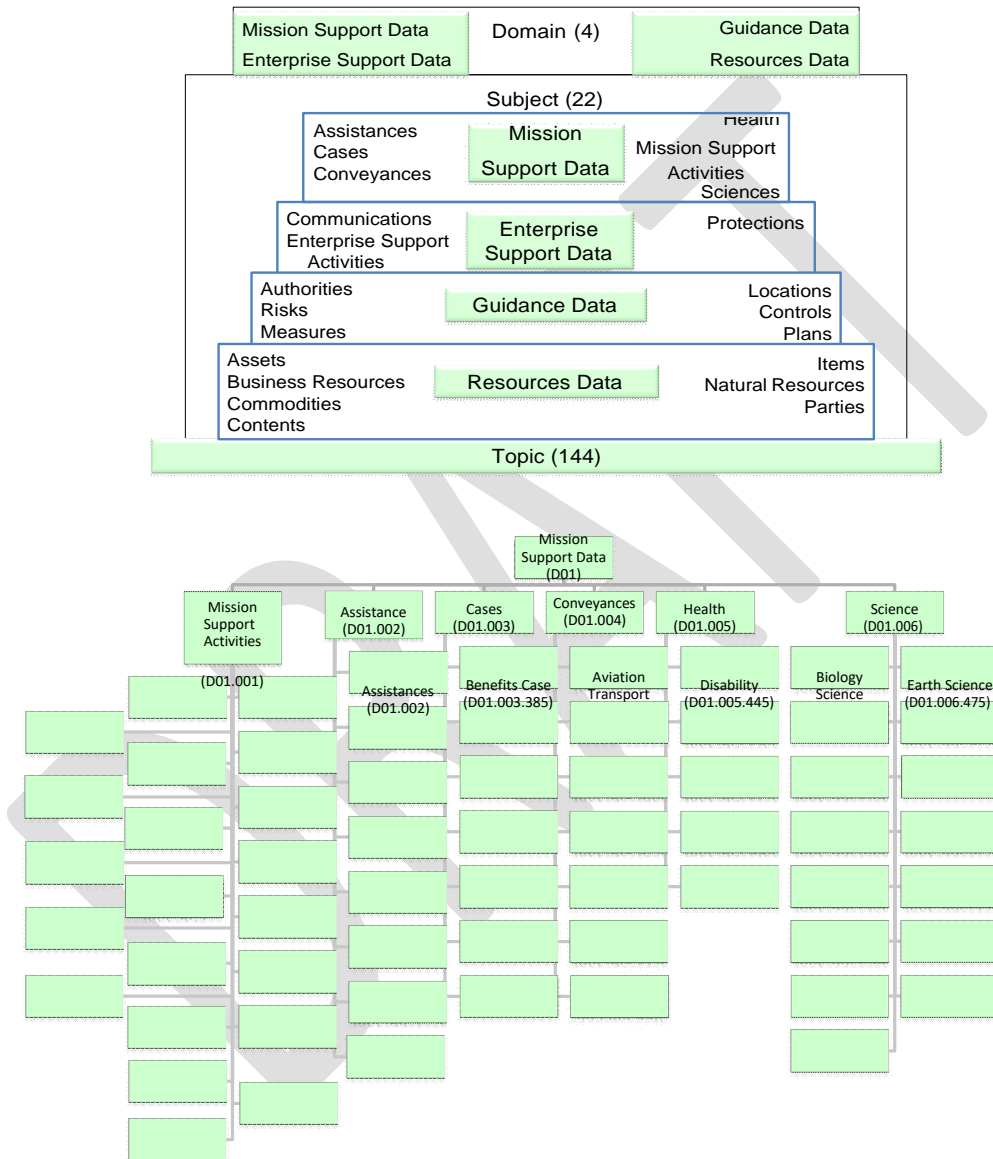
Business Function – Describes what the State government does at an aggregated level, using the budget function classification codes provided in State law.

Service – Further describes what the State government does at a secondary or component level.



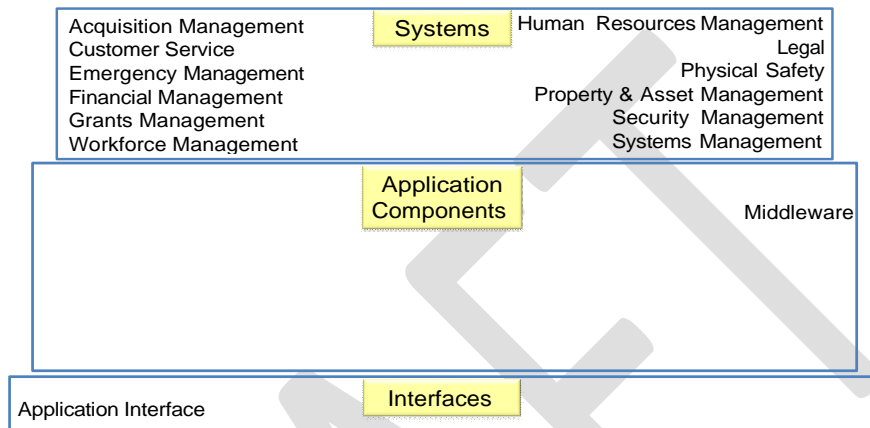
Data Reference Model

The Data Reference Model (DRM) taxonomy is defined by a hierarchy in three layers, as illustrated below. The top level of the hierarchy consists of four *Domains*. The middle layer of the hierarchy contains twenty-two *Subject* elements and the lowest rank of the hierarchy includes one hundred and forty-four *Topic* elements. The DRM provides a structure and vocabulary for agencies to form a consensus as to how to categorize, describe, and share data.



Application Reference Model

The Application Reference Model (ARM) has three hierarchical levels: Systems, Application Components, and Interfaces. *Systems* are discrete sets of hardware and software resources, organized for the collection, processing, maintenance, use, sharing, dissemination or disposition of information in support of a business process. *Application Components* are self-contained software that can be aggregated or configured to achieving business objectives. *Interfaces* are the technical protocols used to transfer information between components.



Appendix D.
Recommended Standards

DRAFT

Appendix E.
Training Curricula

DRAFT